

8. (amended) A liner system as claimed in claim 3 wherein said rigid substrate is metal.

*Supplement A is included herewith to provide a "marked -up" version of claims 1 and 8, as amended above. Supplement B is also included to provide a complete listing and text of all pending and withdrawn claims.

REMARKS

Claim 1 was rejected under 35 U.S.C.102 (b) as being anticipated by Malina. The Malina Patent of record discloses a cyclone housing which defines a cylindrical head section the upper end of which is closed by a cover and has a pipe which forms a tangential inlet to the head section. The housing further includes a conical section which depends integrally from the head section. A liner body in the form of a tubular bladder is configured to line the cylindrical interior of the head section and the interior of the conical section. A vortex finder is interposed between the cover and the upper end of the tubular body and an insert is provided at the apex end of the tubular bladder.

The Malina patent of record fails to show at least a pair of head section abrasion resistant liners arranged in an end-to-end relationship with each other so as to line the cylindrical interior surface of the head section of said inlet housing." Instead, Malina discloses a single head section abrasion resistant liner formed by an upper part of the tubular bladder.

Claim 1 was amended to more clearly distinguish over the art of record. It is well established that in order for a reference to be anticipatory it must disclose each feature of the claimed invention. Therefore , it is respectfully submitted that claim 1 (amended) clearly distinguishes over the Malina Patent of record.

Claims 1,2,3,4,7,8 and 9 were rejected under 35 U.S.C. 103(a) as being unpatentable over Malina in view of Friedrich et al.

The Friedrich et al reference of record discloses an abrasion resistant pipe for transporting abrasive slurries and the like. The pipe includes a structural wall formed of a filament wound fiberglass reinforced material with an elastomeric abrasion resistant material disposed along the inside and/or the outside surface of the pipe.

In making this rejection, the Examiner stated that " Malina teaches a liner system comprising: a cyclone inlet including a head section and a feed duct; and head section abrasion resistant liners at the interior surface of the head section (Fig.2). As discussed above, Malina discloses a single abrasion resistant liner in the head section of the cyclone housing whereas the Applicant specifically claims at least a pair of abrasion resistant liners. Since Malina does not show or suggest the use of at least a pair of abrasion resistant liners in the head section of a cyclone, it is respectfully submitted that claim 1 is not obvious in view of Malina.

With regard to the rejection of claim 2, the examiner stated that Malina does not teach the use of a feed duct liner but that it would be obvious to line the feed duct as taught by Fredrich et al. The examiner's attention is directed to Col.4, lines 42-43 of Malina wherein the use of a feed duct liner is suggested.

Claim 2 is dependent on claim 1(amended) and distinguishes over the art of record for the same reasons that claim 1 distinguishes over the art of record. Claim 2 further distinguishes from the art of record and from claim 1 by adding the limitation of a feed duct liner to the limitations of Claim 1.

With regard to the rejection of claim 3, the Examiner stated that in Malina, "the liner comprises a rigid substrate,26; and an abrasion resistant liner bonded to the rigid substrate, 44. " The Applicant believes that the Examiner has mis-interpreted the Malina disclosure. The reference numeral 26 identifies the liner body as being an assembly which includes the tubular bladder 44 having an insert 46 at its apex end. As seen best in Fig.2, the upper part of the tubular bladder 44 which lines the head section is a single thickness of material which is in contiguous engagement with the cylindrical

upper portion 14 of the cyclone's metallic housing. In view of this, it is respectfully believed that Malina makes no showing or suggestion that the upper part of the bladder comprises a rigid substrate having an abrasion resistant material bonded to the interior surface thereof.

Claim 3 is dependent on claim 2 and is believed to distinguish over the art of record for the same reasons that claim 2 distinguish over the art of record. Claim 3 further distinguishes from the art of record and from claim 23 by setting forth that each of said head section liners and said feed duct liner comprise a rigid substrate with an abrasion resistant material bonded to the interior surface of said substrate.

With regard to the rejection of claim 4, the Examiner stated that "The liners are demountably bonded to the cyclone wall." The Applicant cannot find any showing or suggestion in the Molina reference of record that the tubular bladder is bonded to the cyclone side wall. Col.4, lines 32+ discloses the tubular bladder as having an annular flange 30 at its upper end which rests in an annular groove 32 to position the liner body 26 in the housing.

Claim 4 depends from claim 3 and is believed to distinguish over the art of record for the same reasons that claim 3 distinguish over the art of record. Claim 4 further distinguishes over the art of record and over claim 3 by setting forth at least one attachment means for demountably holding said head section liners in contiguous engagement with the inner wall of the head section of said inlet housing and at least one attachment means for demountably holding said feed duct liner in contiguous engagement with the bottom and side walls of the feed duct of said inlet housing. feed duct.

The Examiner has indicated that Claims 5 and 6 are objected to as being dependent on a rejected base claim but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims.

Claim 5 depends from claim 4 and is believed to distinguish over the art of record for the same reasons that claim 4 distinguishes over the art of record. Claim 5 further distinguishes over the art of record and over claim 4 by setting forth that each of

said attachment means comprises a threaded fastener on the inwardly facing surface of one of said rigid substrates and a bolt extending from the outer surface of said inlet housing into threaded engagement with said threaded fastener.

Claim 6 depends from claim 5 and is believed to distinguish over the art of record and over claim 5 by setting forth that: said threaded fastener is buried within said abrasion resistant material; said bolt has an inner end buried within the abrasion resistant material; and said bolt having an axial bore formed therethrough so that when said abrasion resistant material wears down and the inner end of said bolt is exposed a small amount of the slurry being processed in the cyclone will seep out to indicate that a liner replacement operation should be scheduled.

The Examiner further stated that "The abrasion resistant material is an elastomer (Col.5, lines 48+) and the substrate is metal." The Examiner directed the Applicant's attention to Col.5, lines 48+ wherein it is stated that the wear resistant materials can be relatively hard in some applications and can be relatively soft in other applications, and is thus not limited to being an elastomer. As discussed above, the Molina reference of record makes no showing or suggestion of a substrate rigid or otherwise.

Claim 7 is dependent from claim 3 and is believed to distinguish over the art of record and over claim 3 by setting forth the specific limitation that said abrasion resistant material is an elastomer.

Claim 8 (amended) was amended to correct a unintentional error in the dependency thereof. Claim 8 now properly depends from claim 3 and is believed to distinguish over the art of record and over claim 3 by setting forth that said substrate is metal.

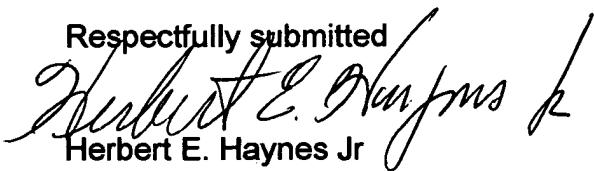
Claim 9 is dependent from claim 2 and is believed to distinguish over the art of record and over claim 2 by setting forth that the claimed combination further comprises: the head section and the feed duct of said inlet housing have open tops; said feed duct liner being of upwardly open U-shape in-cross- section; a cover plate demountably mounted atop said inlet housing for closing the open tops of the head section and the feed duct of said inlet housing; and an abrasion resistant cover plate liner in contiguous

engagement with the downwardly facing surface of said cover plate.

The Escobar et al, Day et al, Metcalf, R. L. and the Townley, J.O. Are secondary references which were not cited against any particular claim. These references have been carefully studied and it is believed that they do not anticipate or make obvious the Applicants claimed invention.

In view of the above, it is believed that the claims as now presented distinguish over the art of record and that the application is in condition for allowance, and such allowance is respectfully requested.

Respectfully submitted



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